

① Solve for x :

$$\begin{array}{r} \frac{1}{2}x + 3 = \frac{1}{4}x - 2 \\ -3 \quad -3 \\ \hline 4(\frac{1}{2}x) = (\frac{1}{4}x - 6)4 \\ 2x = x - 24 \\ -x = -24 \\ \hline x = 24 \end{array}$$

② Solve for h : $V = \frac{1}{3}\pi r^2 h$

$$\frac{3V}{\pi r^2} = \frac{\cancel{\pi r^2} h}{\cancel{\pi r^2}}$$

$$\frac{3V}{\pi r^2} = h$$

Linear Inequalities

I. Write the following inequalities in interval notation:

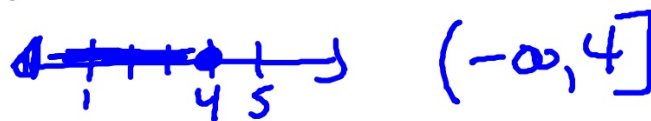
1) $x > 4$ Interval Notation: $(4, \infty)$



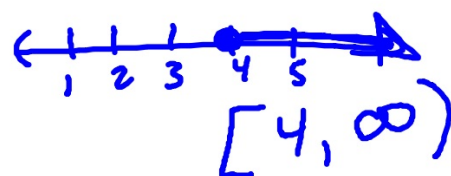
2) $x < 4$ Interval Notation: $(-\infty, 4)$



3) $x \leq 4$ Interval Notation: $(-\infty, 4]$



4) $x \geq 4$ Interval Notation: $[4, \infty)$



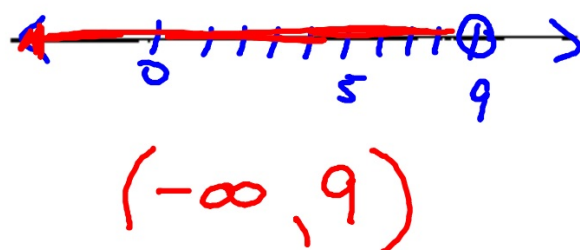
5) $-4 \leq x < 4$ Interval Notation: $[-4, 4)$



I. Solve the given inequality and graph the solution on the number line. Also, give your answer in interval notation.

1) $2x - 5 < 13$

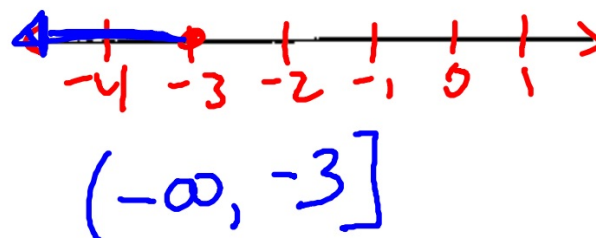
$$\begin{array}{rcl} & +5 & | +5 \\ \frac{2x}{2} & < & \frac{18}{2} \\ x & < & 9 \end{array}$$



2) $-6x \geq 18$

$$\frac{-6x}{-6} \geq \frac{18}{-6}$$

$$x \leq -3$$

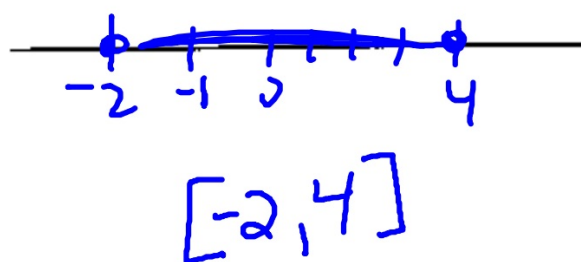


Compound Inequalities

☺ Compound Inequalities are a pair of inequalities joined by *and* or *or*.

Solve and graph the following compound inequalities.

1) $-2 \leq x \leq 4$



$$2) 4 \leq x+3 < 9$$

$$\begin{array}{c} -3 \quad | \quad -3 \quad | \quad -3 \\ | \qquad | \qquad | \end{array}$$

$$1 \leq x < 6$$



$$[1, 6)$$

3) $x \geq -4$ or $x > 1$

$x \geq -4 \cup x > 1$



$[-4, \infty)$
 $x \geq -4$

"Or" - union or everything

4) $7 < 4x + 3$ and $4x + 3 < 19$

Hint: rewrite as $7 < 4x + 3 < 19$

$$\begin{array}{l} -3 \quad | \quad -3 \quad | \quad -3 \\ \hline 4 < 4x < 16 \\ \hline 1 < x < 4 \end{array}$$



$$(1, 4)$$

5) $5x + 1 > 21$ or $3x + 2 < -1$
